UNDERGROUND SPACE

CUMULATIVE SUBJECT INDEX

Volumes 1-5

May 1976 — June 1981

Pergamon Press
New York/Oxford/Toronto/Paris/Frankfurt/Sydney

UNDERGROUND SPACE

Underground Space is the official journal of the American Underground-Space Association, published by arrangement with Pergamon Press.

Underground Space is devoted to the broad technical, legal, and social aspects of expanding the use of this important resource. The Senior Editors are Charles Fairhurst, Head of the Department of Civil and Mineral Engineering, and Raymond Sterling, Director of the Underground Space Center, both at the University of Minnesota. The overseas correspondents, coordinated by Overseas Editor Magnus Bergman, contribute information from around the world on underground space utilization. The Journal's Board of Editors is composed of experts representing the many different professional areas concerned with the underground. The Journal provides broad interdisciplinary coverage of underground space development and does not duplicate existing publications covering specialized fields that contribute to this development.

Senior Editors: Charles Fairhurst, Raymond L. Sterling

Managing Editor: Leslie Roberts

Associate Editor: Donna J. Ahrens

Assistant Editor: Bonita Klosterman

News Editor: Paul Schurke

Overseas Editor: S. Magnus Bergman
Hagconsult AB, Banergaten 3, S-11522
Stockholm, Sweden

Overseas Correspondents

Syd Baggs, University of New South Wales, New South Wales, Australia
Pierre Duffaut, B.R.G.M., Paris, France
Alfred Haack, STUVA, Cologne, West Germany
Antero Hakapää, Finncavern Ltd, Keilaniemi, Finland
Zhu Keshan, Chongqing Architectural Engineering Institute, Chongqing, Peoples Republic of China
Birger Jansson, VBB Vattenbyggnadsbyran, Stockholm, Sweden
A.M. Muir Wood, Sir William Halcrow & Partners, London, England
Laszlo Rózsa, Uvaterv, Budapest, Hungary
H.P.S. Van Lohuizen, Delft Technological University, Delft, The Netherlands

Editorial Board

N.B. Aughenbaugh
University of Missouri-Rolla
Rolla, Missouri

Michael M. Barker
American Institute of Architects
Washington, D.C.

Thomas P. Bligh
M.I.T.
Cambridge, Massachusetts

Tor L. Brekke
University of California
Berkeley, California

Herbert H. Einstein
M.I.T.
Cambridge, Massachusetts

David J. Hammond
Daniel, Mann, Johnson, & Mendenhall
Baltimore, Maryland

William A. Hustrulid
Colorado School of Mines
Golden, Colorado

O. Allen Israelsen
Bovay Engineers, Inc.
Washington, D.C.

Joseph C. Kellogg
Kellogg Corporation
Littleton, Colorado

Royce LaNier
Technical Support Services, Inc.
Washington, D.C.

Robert F. Legget
Consultant
Ottawa, Canada

Russell K. McFarland
U.S. Department of Transportation
Washington, D.C.

Frank L. Moreland
Moreland Associates
Ft. Worth, Texas

David R. Mosena
American Planning Association
Chicago, Illinois

Richard J. Robbins
The Robbins Company
Seattle, Washington

William A. Thomas
American Bar Foundation
Chicago, Illinois

Case Histories
Kenneth S. Lane
Sun City, Arizona

Editorial office: Dept. of Civil & Mineral Engineering, University of Minnesota, 221 Church St. S.E., Minneapolis, Minn. 55455

Underground Space is listed in *Current Contents/Engineering, Technology & Applied Sciences.*

Publishing, Subscription and Advertising Offices: Pergamon Press Inc., Fairview Park, Elmsford, New York 10523, USA; or Pergamon Press Ltd., Headington Hill Hall, Oxford OX3 0BW, England.

Published Bimonthly. *For libraries, university departments, government laboratories, industrial and other multi-reader institutions* (1981) $125.00 (including postage and insurance); *two-year rate* (1981/82) $237.50. Subscription enquiries from customers in North America should be sent to: Pergamon Press Inc., Maxwell House, Fairview Park, Elmsford, NY 10523, USA, and for the remainder of the world to: Pergamon Press Ltd., Headington Hill Hall, Oxford OX3 0BW, UK. *Specially reduced rates for individuals*: In the interests of maximizing the dissemination of research results published in this important international journal, we have established a two-tier price structure. Any individual whose institution takes out a library subscription may purchase a second or additional subscription for personal use at the much reduced rate of $45.00 per annum.

American Underground-Space Association members receive complimentary subscriptions to *Underground Space*. Membership categories are: Individual ($30.00), Junior ($15.00), Corporate ($100.00), and Sustaining ($500.00). To join this open membership, nonprofit organization, see AUA information in the back pages of this issue.

Microform Subscriptions and Back Issues: Back issues of all previously published volumes are available in the regular editions and on microfilm and microfiche. Current subscriptions are available on microfiche simultaneously with the paper edition and on microfilm on completion of the annual index at the end of the subscription year.

Copyright © 1981 Pergamon Press Ltd. Printed in the USA.

Copyright Notice: It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

U.S. Copyright Law applicable to users in the U.S.A.: The Article Fee Code on the first page of an article in this journal indicates the copyright owner's consent that in the U.S.A. copies may be made for personal or internal use provided the stated fee for copying beyond that permitted by Section 107 or 108 of the United States Copyright Law is paid. The appropriate remittance should be forwarded with a copy of the first page of the article to the Copyright Clearance Center Inc., 21 Congress Street, Salem, MA 01970. If a code does not appear copies of the article may be made without charge, provided permission is obtained from the publisher. The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works or for resale. Specific written permission must be obtained from the publisher for such copying. In case of doubt please contact your nearest Pergamon office.

UNDERGROUND SPACE (ISSN 0362-0565) is published bimonthly by Pergamon Press, Fairview Park, Elmsford, NY 10523. Application to mail at Second Class rates is pending at Elmsford, NY and additional mailing offices. **POSTMASTER:** Send address changes to Pergamon Press, Fairview Park, Elmsford, NY 10523.

A cumulative index of news items and feature and research articles appearing in *Underground Space* Vol. 1, No. 1 through Vol. 5, No. 6, arranged in the following categories:

I. Earth-Sheltered and Underground Construction
General
Energy Aspects
Design
Residential and Large-Scale Projects

II. Deep Underground Space Use
Tunneling and Mining
Energy Storage and Production

III. Urban Planning

IV. Psychological Aspects

V. Public Policy

I. Earth-Sheltered and Underground Construction

General

Bennett, D.J. and Eijadi, D.A. Solar optics: light as energy; energy as light, 4:6(349-354).

Brekke, T.L. The Scandinavians are coming (editorial), 2:1(iii-iv).

Bringing earth-sheltered buildings into the commercial sector (interview with David Bennett), 5:6(358-361).

Broch, E. and Rygh, J.A. Permanent underground openings in Norway — design approach and some examples, 1:2(87-100).

Conference considers use of earth-sheltering in developing countries—(report by Barbara Baum and Edward Bittner), 5:6(332-333).

Duffaut, P. Past and future of the use of underground space in France and Europe, 5:2(86-91).

Earth-sheltered homes: weighing the advantages (R. Sterling and W. Shurcliff debate), 5:4(200-204).

Earth-sheltered housing conference and exhibition draws nearly 2,000, 5:2 (72-74).

Fairhurst, C. Beneath the surface (editorial), 1:1(iii-iv).

Fairhurst, C. Deep thoughts in Kansas City (editorial), 5:4(192).

Fairhurst, C. Going under to stay on top, 1:2(71-86)

Fairhurst, C. Some features of underground space use, 5:1(3).

Fairhurst, C. U.S. develops new, commercial uses for earth-sheltering, 5:1 (31-35).

Fairhurst, C. Year three begins — the pace quickens (editorial), 3:1(iii).

Federal subsidies for earth-sheltered structures available soon, 5:4(195).

Hand-carved underground homes visited in China, 5:3(145).

Innovative earth-sheltered designs discussed at Oklahoma City conference, 5:2(74-75).

Jansson, B. Terraspace — a world to explore, 1:1(9-18).

Johnson, R.G. Contractors and earth-sheltered housing, 3:6(285-291).

Jones, D.E., Jr. The expansive soil problem, 3:5(221-226).

Jones, L.S. Non-traditional military uses of underground space, 2:3(153-158).

Kiesling, E.W. Economical wind protection — underground, 4:5(279-282).

Komendant, A.E. Earth-covered structures, 3:6(279-284).

Labs, K. The architectural underground, part I, 1:1(1-8).

Labs, K. The architectural underground, part II, 1:2(135-156).

Lane, C.A. Frequently asked questions on earth-sheltered housing, 4:3 (143-152).

Lanier, R. Assessing environmental impact of earth-covered buildings, 1:4(309-315).

Lanier, R. and Moreland, F. Earth-sheltered architecture and land-use policy (editorial), 1:4(iii-iv).

Legget, R.F. Underground space as a tourist attraction, 3:3(117-121).

Lonsdale, R.E. Underground space as a locational consideration in industry, 1:1(59-60).

May, H. Ionizing radiation levels in energy-conserving structures, 5:6(384-391).

Moreland, F.L. Earth-covered habitat — an alternative future, 1:4(295-307).

Muller, C.A. and Taylor, R.A. No cause for apprehension about costs of insuring earth-sheltered homes, 5:1(28-30).

Phelps, P.A. Variety under the ground (editorial), 2:3(iii-iv).

Raff, S.J. Ground temperature control, 3:1(35-44).

Rosander, A. Underground sewage treatment plants, 2:1(39-45).

Shank, B. The earth-sheltered housing demonstration project. Minnesota Housing Finance Agency, 3:5(259-268).

Shih, J.C. Simplified design procedure of underground shells, 4:1(45-49).

Sisson, G.N. Underground for nuclear protection, 4:6(341-348).

Sterling, R. Earth-sheltered, energy independent (esei) building design project, 1:4(371).

Sterling, R. Structural systems for earth-sheltered housing, 3:2(75-81).

Thompson, R. Air quality maintenance in underground buildings, 1:4 (355-364).

Two new films tell story of earth-sheltering, 5:1(11).

Underground commercial space thrives in China and Japan, 5:5(266).

Underground Space Conference and Exposition (USCE-81) (editorial), 5:5(264-265).

Underground space use promoted in Nigeria, 5:3(143-144).

Vasatka, R. From the new president of the American Underground-Space Association (editorial), 4:3(iii).

Vitt, J.E. and Kjelshus, B. Developing Kansas City's underground space, 4:5(289-292).

Vivian, C.H. Digging to stay alive, 2:4(243-248).

Warnock, J.G. New frontiers of inner space — underground, 3:1(1-7).

Wirth, T.E. Landscape architecture above buildings, 1:4(333-346).

Energy Aspects

Agricultural uses of earth-sheltering discussed at Purdue conference (report by Glenn Strand), 5:6(330-331).

Air from earth moderates temperature in aboveground home, 5:1(9-10).

Bennett, D. and Bligh, T.P. The energy factor — a dimension of design, 1:4(325-332).

Bligh, T.P. Energy conservation by building underground, 1:1(19-33).

Boyer, L.L., Grondzik, W.T., and Bice, T.N. Energy usage in earth-covered dwellings in Oklahoma, 5:4(227-236).

Boyer, L.L., Grondzik, W.T., and Weber, M.J. Passive energy design and habitability aspects of earth-sheltered housing in Oklahoma, 4:6(333-339).

Brown, G.Z. and Novitski, B.J. Climate responsive earth-sheltered buildings, 5:5(299-305).

Energy standards for buildings draw fire from builders and electric utilities, 5:4(198-199).

Fairhurst, C. Energy, conservation, and the underground (editorial), 1:2(iii-iv).

Meixel, G.D., Shipp, P.H., and Bligh, T.P. Analysis and measurement of the thermal behavior of the walls and surrounding soil for a large underground building, 5:2(121-125).

Meixel, G.D., Shipp, P.H. and Bligh, T.P. The impact of insulation placement on the seasonal heat loss through basement and earth-sheltered walls, 5:1(41-47).

Shapira, H.B. and Barnes, P.R. Assessing the performance of an energy-saving design, 5:3(152-157).

—Barnes, P.R. Instrumentation. 5:3(158-159).

Study shows lower energy and construction costs from earth-sheltering, 5:4(197-198).

Szydlowski, R.G. and Kuehn, T.H. Analysis of transient heat loss in earth-sheltered structures, 5:4(237-246).

Design

Duke, Jr., B.W. Incorporating earth-shelter considerations into the design process for nonresidential buildings, 5:3(160-165).

Earth-sheltered buildings prominent among design competition winners, 5:2(67-69).

Earth-sheltered design wins award in Australia, 5:2(70).

Hand-carved underground homes visited in China, 5:3(145).

Innovative earth-sheltered designs discussed at Oklahoma City conference, 5:2(74-75).

Komendant, A.E. Earth-covered structures, 3:6(279-284).

Langley, J.B. The barrell shell — structural rethinking in earth-sheltered design, 5:2(92-101).

Shapira, H.B. and Barnes, P.R. Assessing the performance of an energy-saving design, 5:3(152-157).

Shih, J.C. Simplified design procedure of underground shells, 4:1(45-49).

Sterling, R. Structural systems for earth-sheltered housing, 3:2(75-81).

Thorsen, G.W. and Rue, R.L. High bank instead of high rise — an earth-sheltered approach to medium density housing, 5:3(149-151).

"Urban under unit" promoted in Japan, 5:2(69-70).

Residential and Large-Scale Projects

Ahrens, D.J. "Going under" provides a new industry for Kansas City, 5:1 (15-24).

Bennett, D.J. Walker Community Library: building underground to serve neighborhood needs, 5:2(81-85).

Canadian architects opt for earth-sheltering, 5:1(6).

Carter, D.N. Terraset school, 1:4(317-323).

Costello, M.J. Reclaiming minelands for earth-sheltered housing, 5:5(279-286).

Davis, A. My cave, 2:3(151-152).

Frenette, E. Environmental learning center — a site-integrated energy-efficient wilderness school, 4:4(199-207).

Hand-carved space below the desert combines an orchard and a home, 5:5 (266-267).

Heim de Balsac, R. The operation and architectural quality of Les Halles, 5:3(166-170).

Highway rest-area program incorporates earth-sheltering, 5:1(8).

Insurance firm answers land and energy concerns with underground addition, 5:6(329-330).

Jahn, H. Minnesota II — underground addition to state capitol, 1:4(365-369).

Kierans, T.W. St. John's Harbour's South Side Hills internal development concept or going underground for multi-use space, 3:5(229-241).

Kovac, M. Subterranean museum for Pharaoh's funeral vessel at Giza, Egypt, 3:6(303-308).

Langley, J.B. The barrel shell — structural rethinking in earth-sheltered design (the Ward earth-sheltered home), 5:2(92-101).

Large earth-sheltered housing complex nears completion, 5:2(66-67).

McCahill, G. Underground parking at Queen's University, 1:4(347-353).

O'Reilly, M.P. Some examples of underground development in Europe, 2:3(163-178)

Pilon, B. In Paris, a "city center" goes underground (Les Halles redevelopment), 5:2(102-120).

Proposals for Les Halles include underground information center, 5:1(10-11).

Underground grain storage system proposed for Egypt, 5:3(142).

Underground ski lift built in Switzerland, 5:1(9).

Vicker, R. Underground condominium offers haven for pessimists, 5:6 (356-367).

Vitt, J.E. and Kjelsus, B. Developing Kansas City's underground space, 4:5(289-292).

II. Deep Underground Space Use

Tunneling and Mining

Abandoned mine serves as greenhouse, 5:6(332).

Bartlett, J.V. Underground railways and tunnelling. An overview of British activities, 4:3(137-142).

Bhappu, R.B. In-situ mining technology, 2:4(211-221).

Black, P. Water supply and sewerage services: present and future, 4:4 (187-197).

Broch, E. and Rygh, J.A. Permanent underground openings in Norway — design approach and some examples, 1:2(87-100).

Cobbs, J.H. Blind boring for shafts, 3:4(195-200).

Cording, E.J. Control of ground movements and support of tunnels — research and practice, 2:2(113-119).

Crookston, R.B. Mining oil shale, 2:4(229-241).

Cutting the high cost of subways (interview with Russell McFarland, 5:6(334-336).

Daemen, J.J.K. Problems in tunnel support mechanics, 1:3(163-172).

Dayton, S. The challenge for mining in America, 2:4(181-193).

Deep tunnel's development: the story behind Chicago's massive sewer project (interview with Vinton Bacon), 5:2 (76-79).

Drains being built to dry out Windy City are subject of controversy and acclaim, 5:2(77).

Duffaut, P. Ground pressure and tunnelling from the nineteenth century to the present, 1:3(185-200).

Faddick, R.R. and Martin, J.W. Materials handling research for tunnelling, 2:2(121-127).

Fairhurst, C. Diverse tunneling technology efforts need coordination (editorial), 5:2(58).

Fairhurst, C. Mining — our largest underground space program (editorial), 2:4(iii-iv).

Fairhurst, C. Tunnel supports: tradition and change (editorial), 1:3(iii-iv).

Future coal mining technology expected to focus on underground operations, 5:2(71-72).

Hakala, W. U.S. drilling and tunneling research (editorial), 2:2(iii-iv).

Herbeck, J. Construction of the Tauern Summit Tunnels, part I, 1:3(201-226).

Herbeck. J. Construction of the Tauern Summit Tunnels, part II; Katschberg tunnel excavation through rock and comparison with Tauern tunnel work, 1:4(373-391).

Hockman, E.L. Environmental impact of solution mining, 2:4(223-228).

Improving technology for the ingrated use of the subsurface (interview with H.C. Fischer), 5:1(12-14).

Isgaard, E. and Leeney, J.G. Boldness is needed when planning for underground utility systems, 5:6(370-374).

Ishihara, K. Earth pressure balanced shield tunneling method: water pressure type, 4:2(95-101).

Lane, K.S. Buttress portals at Garrison tunnels, 3:3(141-143).

Lane, K.S. Instrumented tunnel tests: a key to progress and cost saving, 1:3 (247-259).

Lane, K.S. San Fernando Tunnel explosion, 4:4(217-219).

Lane, K.S. San Jacinto Tunnel, 3:2 (91-93).

Lane, K.S. Tecolote Tunnel, 3:4 (201-205).

Lane, K.S. Tunnel portal failure at DeGray Dam, 4:6(355-359).

Lane, K.S. Tunneling in swelling rock, 4:1(51-61)

Lane, K.S. Tunnel vs. buried valleys, 3:1(45-47).

Legget, R.F. Underground mining with controlled subsidence to Lower Duisburg Harbor, 1:1(51-58).

Lenzini, P.A. Ground stabilization: review of grouting and freezing techniques for underground openings, 1:3(227-240).

Lyons, A.C. Some developments in segmental tunnel linings designed in the

United Kingdom, 1:3(173-183).

Margison, A.D. Canadian underground NORAD economically achieved, 2:1(9-17).

Mathews, K.E. Design of underground mining layouts, 2:4(195-209).

Maurer, W.C. Advanced excavation methods, 2:2(99-112).

Nelson, C.R. Spray grouting for tunnel support and lining, 1:3(241-246).

Norman, N.E. and Dye, J. Economic factors of mechanical raise boring, 2:4 (249-260).

O'Rourke, T.D. Systems and practices for rapid transit tunneling, 4:1(33-44).

Paulson, B.C., Jr. Japan's Nakayama Tunnel, 5:6(337-343).

Proceedings of the French Association for Underground Works (AFTES) Symposium (Paris, 26 October 1978) on: Analysis of tunnel stability by the convergence-confinement method, 4:4(221-258), 4:5(297-318), 4:6(361-402).

—Duddeck, H. On the basic requirements for applying the convergence-confinement method, 4:4(241-247).

—Gesta, P., Kerisel, J., Londe, P., Louis, C., and Panet, M. General report; tunnel stability by the convergence-confinement method, 4:4(225-232).

—Kerisel, J. Commentary on the general report, 4:4(233-239).

—Lombardi, G. Some comments on the convergence-confinement method, 4:4(249-258).

—Lupiac, L. and Chambron, E. Opening remarks, 4:4(221-223).

—Egger, P. Deformations at the face of the heading and determination of the cohesion of the rock mass, 4:5(313-318).

—Fairhurst C. and Daemen, J.J.K. Practical inferences from research on the design of tunnel supports, 4:5(297-311).

—Afternoon session on analysis of tunnel stability by the convergence-confinement method, 4:6(361-402).

Silver, M.L. and Peters, J.F. Planning and its importance in reducing the cost of urban tunnels, 2:2(65-79).

Stahre, P. Fundamentals of the use of rock tunnels for the storage of sewage water, 5:5(290-292).

Svanholm, B.F., Persson, P.A., and Larsson, B. Smooth blasting for reliable underground openings, 3:3(133-140).

Tunneling technology cost and technology transfer discussed at UTRC, 5:2(75).

UTRC conference brings together experts from various phases of deep space development, 5:4(195-197).

van Lohuizen, H.P.S. Research of the tunneling section of the Royal Institution of Engineers in The Netherlands, with special emphasis on immersed tunnels, 4:2(111-116).

Walton, M. Environmental trade-offs of tunnels vs cut-and-cover subways, 3:2(61-67).

Wanner, H. Deciding on the excavation method of a tunnel — from the geologist's point of view, 3:6(293-296).

Waters, J. Black Diamond Mines, 2:3(143-150).

World's longest highway tunnel completed in Switzerland, 5:2(67).

World's longest tunnel being built to boost Finland's water supply, 5:6(331).

Energy Storage and Production

Atwood, G. Surface and underground disposal of coal mine wastes, 1:2 (111-121).

Atwood, G. Surface and underground disposal of coal mine wastes — part II, 1:3(261-281).

Bach, P.J. A summary of studies on underground nuclear power plant siting, 2:1(47-51).

Bergman, S.M. Geo-planning — the key to successful underground construction, 2:1(1-7).

Bjurstrom, S. Transport and storage of heated water in unlined rock openings, 3:3(123-131).

Christenson, K. LNG storage in insulated rock caverns, 4:4(209-216).

DOE project explores energy storage potential of aquifers, 5:1(7).

Electricity produced from hot dry rock geothermal project, 5:3(142-143).

Future coal mining technology expected to focus on underground operations, 5:2(71-72).

Geopressured energy under close study, 5:2(72).

Haimson, B.C., Hartwig, K.T. and Doe, T.W. Underground caverns for energy storage using superconductive magnets, 2:3(137-142).

Hansagi, I. and Hedberg, B. Large rock caverns at KLAB mines, 4:2(103-110).

Hunt, F.R. Underground power transmission, 3:1(19-33).

Jansson, G. Storage of petroleum products in unlined caverns, 2:1(27-37).

Jansson, G. and Soderberg, L. Obstacles to subsurface storage of oil; experiences in various countries, 5:4(209-212).

Johansson, S. Geological surveys for underground oil storage facilities, 5:1(36-39).

Lane, K.S. Underground oil storage pioneering in Hawaii, 4:3(165-169).

Legget, R.F. 75-year old underground compressed air plant still in use in Canada, 4:1(29-31).

Legget, R.F. The world's first underground water power station, 4:2(91-94).

McCarthy, D.F. Underground "mined-type" LPG storage, 3:5(243-251).

Mining could increase petroleum reserves, 5:1(11).

Moberg, S.H. Energy requirements for the storage of oil in rock caverns, 4:2 (77-83).

Neretnieks, I. Safety tunnel for core melting in nuclear power plants, 5:3(179-180).

Nilsson, S.O. Feasibility of underground storage plants in metropolitan areas: a study of major economic factors, 4:3(153-158).

Nuclear power plants in mined caverns: conceptual design and estimated cost (Executive Summary), 3:5(253-257).

Nyman, H.D. District heating systems promise economic and environmental savings, 5 :1(25-27).

Oberth, R.C. and Lindbo, T. Underground nuclear power plants: state of the art, 5:6(375-383).

Oberth, R.C. and Lee, C.F. Underground siting of CANDU power stations, 4:1(17-27).

Russell, J.E. Underground storage of nuclear waste, 2:2(91-97).

Shaw, D.E., Plooster, M.N., and Ellison, R.D. Explosion impacts in underground crude oil storage, 5:5(293-298).

Swedish Nuclear Fuel Safety Project Staff. Handling of spent nuclear fuel and final storage of vitrified high level reprocessing waste, 3:2(87-90).

Sweden tests underground heat storage, 5:5(271).

Tarkoy, P.J. Use of underground space for developing oil and gas reserves, 2:3(159-161).

Tunnel system for mining oil beneath the sea bed proposed, 5:3(144-145).

Underground heat storage and geothermal energy discussed at IECEC conference (report by Louis Goldberg), 5:5 (272-273).

Underground steam generator helps move heavy oil, 5:2(71).

Underground storage capacity expanded in Finland, 5:3(143).

Walton, M.S. Geological opportunities and constraints on the use of underground space, 5:5(287-289).

Wettlegren, G. Underground oil storage in disused mines, 3:1(9-17).

Willett, D.C. The bulk storage of energy underground, 3:2(83-85).

Witherspoon, P.A., Lindblom, U., Morfoldt, C.O., and Janelid, I. Gas storage in mined caverns, 1:1(35-49).

III. Urban Planning

Barker, M. The urban underground: shaping our cities (interview), 5:3 (146-148).

Deep tunnel's development: the story behind Chicago's massive sewer project (interview with Vinton Bacon), 5:2(76-

Jansson, B. City planning and the urban underground, 3:3(99-115).
Lambert, B. Planning for energy needs: a look at three new communities, 5:6(362-369).
Legget, R.F. What every city should do about geology — and its underground, 4:5(273-277).
Lupiac, L. Underground mass-transit systems: the optimum solution in major cities, 5:4(213-218).
Mosena, D. and Muir Wood, A.M. Planners and the underground. Urbanization and protection of the city environment (editorial), 4:5(iii).
Raskin, E. The underground city, 3:5(227-241).
Strzelecki, Z. Efforts to restore underground facilities from the Middle Ages and rescue historical towns in Poland, 4:3(159-164).
Two new films tell story of earth-sheltering, 5:1(11).

IV. Public Policy

Ahrens, D.J. and Roberts, L. A promising partnership grows from Rockstore 80, 5:2(61-65).
Barker, M.B. Earth-sheltered construction: thoughts on public policy issues, 4:5(283-288).
Bergman, M. Dialogue with decision makers, and Rockstore 80 (editorial), 3:6(iii-iv).
Coogan, A.H. Classification and valuation of subsurface space, 3:4(175-186).
de Saventhem, E.M. Insuring risks underground — some general considerations, 2:1(19-25).
Duffaut, P. Site reservation policies for large underground openings, 3:4 (187-193).
Fairhurst, C. Communication and collaboration (editorial), 3:2(iii-iv).
Fairhurst, C. Enough of the rhetoric — where are the designs? (editorial), 5:3(138).
Fairhurst, C. Radioactive waste — the problem that won't go away (editorial), 3:3(iii-iv).
Fairhurst, C. Rockstore 80 an important and timely meeting, 4:1(iii-iv).
Fairhurst, C. Rockstore 80 — just another conference, or will it be more? (editorial), 5:1(3-4).
Fairhurst, C. Thinking deep (editorial), 5:6(326).
Financial incentives and stronger energy standards needed to achieve conservation goals, reports Worldwatch study, 5:5(267-271).
Goals for subsurface use: why we fell short in the '70s and how we can meet them in the 80s (interview with J. Kellogg), 5:4(205-207).
In the event of catastrophe, 5:6 (344, 349-355).
Jansson, G. and Soderberg, L. Obstacles to subsurface storage of oil; experiences in various countries, 5:4(209-212).
Kellogg, J.C. Contract problems in major underground construction projects, 1:2(101-109).
Korel, M.L. Financing earth-sheltered housing: issues and opportunities, 3:6(297-301).
Manson, D. Equity requirements of earth-covered buildings and instruments of remedy, 1:2(123-126).
Moe, R.D. Technology and the legislator: the value of communication, 4:1(1-10).
Muller, C.A., de Saventhem, E.M. and Aickin, R.M. Insuring innovation: coverage for underground storage projects, 5:4(224-226).
Murphey, W. Civil defense: a 1981 appraisal, 5:6(345-348).
Paulson, B.C., Jr. Research and development needs for systems and management in underground transportation construction, 2:2(81-89).
Riechers, M. Federal activities in earth-sheltered and underground construction, 5:5(275-278).
Swenson, G.S. Zoning ordinances as obstacles to earth-sheltered housing: a Minnesota perspective, 3:4(165-174).
Thomas, W.A. Ownership of subterranean space, 3:4(155-163).
Thomas, W.A. Technology, law, and public perceptions of subterranean space (editorial), 3:4(iii-iv).
Underground Space Center. Cost and code study of underground building: a report to the Minnesota Energy Agency, 4:3(119-136).
Underground Space Conference and Exposition (USCE-81) (editorial), 5:5 (264-265).
Underground technology can advance through government, industry cooperation (editorial), 4:4(iii-iv).
Winqvist, T. How can society encourage appropriate use of subsurface space? 5:4(219-223).

V. Psychological Aspects

Foster, E.L. Social Assessment — a means of evaluating the social and economic interactions between society and underground technology, 1:1(61-63).
Gnaedinger, J.P. Attitude and communication in the management of underground construction projects, 4:2(85-89).
Hollon, S.D., Kendall, P.C., Norsted, S. and Watson, D. Psychological responses to earth-sheltered, multilevel, and aboveground structures with and without windows, 5:3(171-178).
Lutz, F.W. Studies of children in an underground school, 1:2(131-134).
McKown, C. and Stewart, K.K. Consumer attitudes concerning construction features of an earth-sheltered dwelling, 4:5(293-295).
Paulus, P.B. On the psychology of earth covered buildings, 1:2(127-130).
Stewart, K., McKown, C., and Peck, C. Consumer attitudes concerning an earth-sheltered house, 4:1(11-15).